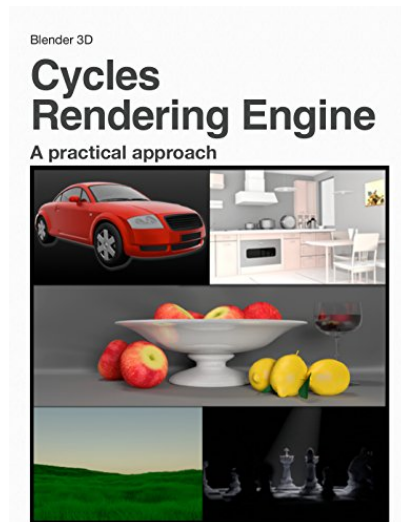


# Book Blender 3D 2.7x Cycles Rendering Engine: A practical approach PDF



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Book Blender 3D 2.7x Cycles Rendering Engine: A practical approach by *by Francesco Milanese*

## Book Blender 3D 2.7x Cycles Rendering Engine: A practical approach PDF

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Cycles is a rendering engine, a program that transforms a 3D virtual environment into a 2D image, or render. It does this by making calculations of the lighting and shading of the scene, taking into account factors such as the nature of “physical” objects - their textures, the effects - in order to produce the end result. From version 2.62 of Blender, Cycles comes ready-installed, and since then the list of functionality has grown, with new features in each release.

This manual is aimed at those who have a basic knowledge of Blender and want to know the features, functions and capabilities of Cycles rendering engine; a basic knowledge of Blender Render is recommended, yet not required.

Even those who already have a good knowledge of Cycles will find this manual useful, since they can expand and deepen the knowledge of the tools and key techniques of lighting and shading.

Francesco Milanese is a Blender Foundation Certified Trainer; he publishes (video)tutorials and books on Blender and other CG software.

### === SUMMARY ===

Introduction: Cycles Render  
Shaders and Nodes

Insight: Global Illumination and Direct Lighting - Samples and Light Path Integrators  
BiDirectional Path Tracing  
Global Illumination  
Direct Lighting  
BSDF and BSSRDF

Before you begin: Nodes Editor, and basic commands  
Engine choice, the rendering engine  
GPU Compute with CUDA devices  
Rendered Preview and real-time interactivity  
Final rendering  
Nodes and Node Editor  
Shaders, Colors and Object Color in the 3D View  
The Scene Files and Resources of This Manual

Scene 1: Still Life  
Preliminary Operations and Settings  
Device: CPU and GPU Compute

Render – Sampling and Clamping  
Render – Integrators and Light Paths  
Lighting: standard light sources (Area Lamp)  
Cloth: Velvet Shader (mixed with Diffuse), part I: overview  
The Diffuse Shader  
The Velvet Shader  
The Mix Shader Node  
Cloth: Velvet Shader (mixed with Diffuse), part II: the making  
Glass (and wine): not only Glass  
The Glass Shader  
The Glossy Shader  
The Transparent Shader  
Alternatives: The Translucent and the Refraction Shaders  
The Light Path Node; output "is Shadow Ray" as Mix Factor  
Final scheme of the Nodes for the glass  
Wine Nodes scheme  
The dish: ceramic (simple mix)  
Fruit, Part I: Diffuse Shaders; Image Textures  
UV Mapping Textures  
Bumping; grayscale for Displacement  
RGBtoBW and Math Multiply  
Tips  
Fruit, Part II: Normal vs. Displacement  
Material Output Displacement  
Bumping: Normal and Displacement  
Normal Map Node  
Final thoughts

Scene 2: car  
Preliminary Operations and Settings  
Film – Transparent  
Samples and Other Settings  
Lighting: HDR Images; Equirectangular Environment  
LDR and HDR Images  
In Blender and Cycles: World Background and Environment Texture  
Equirectangular and MirrorBall  
Using an image as an HDR Environment Texture  
Ambient Occlusion  
The Body: Fresnel Mix  
The Fresnel Effect  
Using Holdout and Emission to Interpret Fresnel (and Other Effects)  
Alternatives: Layer Weight Node

Scene 3: Interior  
Preliminary Operations and Settings; Base Materials  
Lighting: Planes with Emission and Ambient Occlusion  
Ambient Occlusion  
The Planes with Emission Shaders  
Anisotropic Shader

Scene 4: Exterior  
Preliminary Operations and Settings  
Lighting: World Sky Background  
The Grass : Materials for Hair Strand  
CPU Experimental  
The Material to Use, Part I  
The Material to Use, Part II : Hair Info Node  
Cycles Hair Rendering  
Volumetric Effects  
Volume Absorption  
Volume Scatter  
Limitations

Scene 5: Sub Surface Scattering  
The SSS Node; Comparison with Diffuse  
Example: Marble Chess Board  
Global Settings  
The Spot Lamp  
Volumetric Material (Cone of Light)  
Pieces and Chessboard Materials: SSS and Color Mix  
Depth of Field for the Camera Object  
Ray Length and Ray Depth

Appendix A: Toon Shader  
Appendix B: OSL (Overview)  
Appendix C: Motion Blur; Object Info  
Motion Blur  
Object Info and Color Ramp  
Appendix D: Compositing the Render

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